

limits that would allow broadcasters to verify compliance through calculation.⁴⁰ In essence, the NAB sought to devise a table or graph that would enable broadcasters to determine, based on their frequency of operation and effective radiated power, the distance from the radiating structure where the level of predicted induced currents would fall below the standard. It was envisioned that this study would form the basis for a revised Technical Bulletin OST 65, which describes similar analytical methods for determining compliance with the Commission's existing rules.

The Broadcast Joint Commenters have reviewed the NAB's study, which is being submitted today to the FCC.⁴¹ That study, authored by the prominent authority Jules Cohen, was based on a collection of the best data available, from a number of scientific reports detailing experiments on the measurement of induced body currents under disparate conditions. However, because Mr. Cohen's mandate was, in the first instance, to develop a worst-case analysis, the data he used reflected the most egregious of possible exposure scenarios.⁴² Thus, for example, some of the data employed by Mr. Cohen involved the measurement of currents through barefoot humans or models standing upon highly conductive copper flooring. Experiments conducted under such conditions, which are not indicative of real-world exposure scenarios, will tend to

⁴⁰ See NAB, Request for Extension of Time, ET Docket No. 93-62 (filed July 9, 1993).

⁴¹ Jules Cohen, Proposed Revision of OST Bulletin No. 65 (Oct. 12, 1993).

⁴² Mr. Cohen has confirmed this fact in conversations with CBS personnel.

exaggerate the levels of induced currents which will be generated within the body by particular RF fields.

NAB's study represents an excellent analysis of the available data. However, because the study was based on worst-case figures, we believe that it overestimates the level of protection needed to ensure that induced current levels do not exceed the standard under real-world conditions.⁴³ For example, wearing shoes or standing on something other than a grounding plate will partially isolate humans from ground and reduce the level of current flow through the body.⁴⁴ The Broadcast Joint Commenters support, however, the structure and presentation of the NAB study and recommend that the FCC ultimately incorporate a similar study based on real-world measurements into Technical Bulletin OST 65.

Broadcasters had hoped that more complete real-world induced current data would be available in the initial comment phase of this proceeding. They had wanted to examine such data and incorporate it into analytical models for use in determining compliance without field measurements. Mr. Parnau's results, however, are too

⁴³ Thus, at frequencies of interest to TV and FM broadcasters, the NAB's study indicated that compliance with the induced current standards could be assured only when the electrical fields were within a range of approximately 16 to 42 percent of the ANSI/IEEE maximum permissible exposure level. Parnau Engineering Statement at 2.

⁴⁴ Parnau Engineering Statement at 3. Moreover, data relied on by the NAB in its studies involved persons subjected to vertically-polarized plan waves whereas FM and TV broadcast transmissions are horizontally and circularly polarized. *Id.* at 3.

preliminary to permit the creation of such models.⁴⁵ Moreover, those results must be treated with caution in view of the problems with measurement reliability which he experienced and which are described above and in his engineering statement.

Nevertheless, the numerous readings that Mr. Parnau made almost uniformly suggest that the levels of body currents induced under actual field conditions may be far below those recorded in the literature at the same field strengths. Indeed, Mr. Parnau's preliminary work suggests that for many broadcast operations, compliance with the relevant MPE limit may be sufficient to ensure compliance with the induced current standard. Thus, with the exception of two anomalous cases, the data reflected in Figures 1-4 of Appendix A to his engineering statement indicate that body currents exceeding the 1992 ANSI/IEEE standard were not induced in RF fields within maximum field exposure limits.

Based on these preliminary results, the Commission should undertake an effort to identify appropriate meters and collect real world exposure data for use in revising Technical Bulletin OST 65. The Broadcast Joint Commenters are prepared to provide the Commission with any necessary assistance in this endeavor, both by collecting actual measurements near broadcast sites and by refining analytical techniques to enable

⁴⁵ In this connection, we note that the number of sites at which CBS was able to make measurements during the initial comment phase of this proceeding was limited by its difficulty in obtaining an induced current meter with which to conduct its tests. Despite previous efforts to obtain such a device, it was not until early November 1993 that CBS was able to borrow a prototype induced current meter from Narda, which it was allowed to keep for only a two week period. CBS's order for a production model of the meter was not filled until mid-December of last year. The relative unavailability of induced current meters during the comment period illustrates further why it would be premature for the Commission to require compliance with the induced current standard before further studies directed to specifying an appropriate measurement methodology can be undertaken.

a majority of broadcasters to determine compliance with the RF standards, including the induced current standards, through calculation rather than direct measurement. In our view, it is essential that this process be completed before implementation of the new induced current standard. As indicated above, the preliminary field studies conducted by CBS to date suggest both that significant questions remain to be resolved regarding the reliability of existing methods of making induced current measurements, and that compliance with the induced current standard may be possible at significantly greater percentages of maximum permitted field exposures than suggested by the literature. Thus, neither actual measurements, nor reliance on existing analytical models, provides an adequate compliance alternative for broadcasters at this point. To state the obvious, the Commission should avoid a situation in which broadcasters are either forced to make complex and expensive actual measurements of dubious reliability or, in the alternative, rely on compliance models that are more restrictive than necessary to protect the public health.

To this end, prior to implementing the induced current standard, the Commission should (1) specify particular measurement techniques after establishing their reliability; and (2) adopt reality-based safe harbors on the basis of real-world measurements made using those techniques. These guidelines should be incorporated into Technical Bulletin OST 65. Any other course would impose huge costs on broadcasters, in financial terms and in delays in the licensing process, that could cause

serious harm to the broadcast industry and the viewing and listening public, without any corresponding benefit to society.

**B. The Commission Should Clarify
Certain Aspects of the Induced
Current Standard**

**1. The Induced Current Standard Should
Account For Transient Exposure**

The new ANSI/IEEE standard defines the maximum permitted levels of induced and contact currents that can be generated in controlled and uncontrolled environments.⁴⁶ This induced current standard is based on the same tissue-heating specific absorption model as the MPE standard.⁴⁷ Put differently, the ANSI/IEEE standard for induced currents is designed, like the ANSI/IEEE MPE standard, to prevent tissue heating at levels uncomfortable to humans. And, like the MPE, the induced current standard differs for controlled and uncontrolled environments, with the former defined as including transient passage.

Inexplicably, however, the section covering controlled environments notes parenthetically that the level of induced rms RF body current should be time averaged over one-second periods, rather than the six-minute intervals that are used in defining the limits for the maximum permitted exposure to electromagnetic fields in controlled

⁴⁶ ANSI/IEEE Standard, §§ 4.1.1, 4.1.2.

⁴⁷ ANSI/IEEE C95.3 Measurement Procedures, § C4.

environments.⁴⁸ Despite the fact that the consequence of the two risks is identical, *i.e.*, heating of body tissues, the induced current standard as written suggests that body tissues heat and cool instantaneously, while the MPE recognizes that brief exposure to higher fields will not raise body temperatures significantly.⁴⁹ This is completely illogical -- the principal risk of exposure to an RF field against which the ANSI/IEEE seeks to protect is tissue heating that results from body currents induced by that field.⁵⁰ The MPE limits and the body current limits are merely two measures seeking to protect against the same risk, *i.e.*, current flow from the body to ground, and are set at a level that is supposed to prevent the same current flow.⁵¹

Since exposure to all fields induces some body current, a one-second measure of current flow will always exceed an averaged flow if exposure is not continuous. Moreover, averaging induced current measurements over one second will be difficult to perform for an individual only transitorily exposed to an RF field. As a result, the Broadcast Joint Commenters are concerned that some could read the standard to

⁴⁸ ANSI/IEEE Standard, § 4.1.1(a).

⁴⁹ *Id.*, § 6.8.

⁵⁰ Moreover, to the extent the induced current limitations are intended to prevent excessive heating of a person's ankles or feet, this dichotomy is particularly mystifying in light of the fact that "peak SARs in a biological body can be 10 to 20 times higher than the average SAR." Consequently, the ANSI/IEEE standard permits the MPE "to be exceeded if it can be shown that ...the spatial peak value of the SAR ...over the [six minute] averaging time does not exceed 20 W/kg (controlled environment)... in wrists, ankles, hands and feet." ANSI/IEEE Standard, § 6.10 (footnote omitted).

⁵¹ See, *e.g.*, Comments of Hatfield & Dawson, Consulting Engineers, Inc., ET Docket 93-62, at 6 (filed Nov. 12, 1993).

prohibit any exposure, however brief, to a field in which body currents in excess of the ANSI/IEEE Standard could be induced.

Such a reading of the ANSI/IEEE standard is not proper. The definition of a controlled environment (used both for the MPE and for the induced current standard) permits transitory exposure. Moreover, the concept of transient exposure is wholly appropriate for overall exposure and for induced body currents; it is only inappropriate for contact currents.⁵² The Broadcast Joint Commenters therefore urge the FCC to seek clarification from the appropriate IEEE subgroup that the exposure of transients to induced body currents presents no risk. In the alternative, the Commission could adopt a specific time averaging factor (similar to that permitted for MPE's) that could apply to induced current measurements.

Averaging exposure levels to induced currents over one-second intervals (effectively instantaneous) would tremendously burden broadcasters with no concomitant increase in safety to the public. Broadcasters would be required to ensure that many areas near broadcast transmitting facilities were off limits to all persons at all times. Not even transient passage by those maintaining the transmitting system would be permitted. Interpretation of the standard in that fashion would result in the *induced current* standard being far more restrictive than the MPE requirement, despite ANSI/IEEE's conclusion that the risks of induced currents are identical to the

⁵² The one-second time averaging only makes sense for contact currents which, at high levels, have a "startle" effect on humans similar to electrical shocks. Since induced currents do not produce this same startle effect, the Broadcast Joint Commenters question whether its application to that phenomenon was mistakenly included in the standard.

substantiated risks of electromagnetic fields. Because a non-time averaged application of the induced current standard would be illogical, the FCC should seek clarification from the relevant IEEE committee and ensure that the Commission's measurement guidelines, including those for induced currents, fully recognize the concept of transient exposure.

**2. The Commission Should Investigate
the Proper Frequency Limits For
Induced Current Measurement
Requirements**

The Commission needs to resolve the question of the required upper limit for induced current compliance. As the *NPRM* notes,⁵³ the IEEE/ANSI standard mandates induced current measurements for RF emitters up to 100 MHz, a frequency squarely within the middle of the FM broadcast band. Absent a substantiated biological rationale, it makes little sense to require a station operating at 99.9 MHz to demonstrate compliance, while an identically powered station at 100.1 MHz is exempted. It is hard to imagine that induced currents from the first station could present a safety risk absent from the second facility.

The record in this proceeding reflects the scant research performed in this area thus far. A recent paper authored by Messrs. Tofani, Gandhi and others concedes that there is "a lack of experimental data on foot currents induced by RF EM fields for

⁵³ 8 F.C.C. Rcd at 2852.

frequencies in excess of 50 MHz."⁵⁴ As a result, others have suggested that the ANSI/IEEE selection of 100 MHz as the induced current cut-off is wholly arbitrary.⁵⁵

The Tofani paper represents the first data on induced currents near 100 MHz. The paper reports measurements in part of the FM broadcast band (90-104 MHz) and recommends that the induced current standard be extended throughout the FM band (*i.e.*, to 108 MHz) or beyond.⁵⁶ Tofani's results are not yet supported by other researchers, and were published too late to be included in the ANSI/IEEE process.

The Broadcast Joint Commenters suggest that existing data on this issue are meager. However, greater clarity should emerge when the Commission adopts standards for induced current measurement procedures, as described above. Once the Commission settles on the required measurement technology and standard human modeling, researchers will be able to inquire into the proper placement of the cut-off for induced current measurements.⁵⁷ The question of the proper cut-off frequency for induced current measurements, therefore, should be addressed in the revision of Technical Bulletin OST 65, a process in which researchers, industry and the Commission can all cooperate.

⁵⁴ S. Tofani, *supra* note 37, at 2.

⁵⁵ *Cf.* Broadcast Signal Lab Comments, ET Docket No. 93-62, at 4 (filed Nov. 12, 1993).

⁵⁶ *Id.* at 6.

⁵⁷ In particular, the Broadcast Joint Commenters note that the data used in the Tofani experiment were derived from the Gandhi meter, an induced current measurement device that may be different from the standard the Commission ultimately adopts. Moreover, the Tofani paper used a human "model" that may not be the same as the one eventually integrated into the agency's compliance procedures.

**C. The Commission Should Clarify How
it Proposes To Require Compliance
with the Contact Current Standard**

The proposed standard for contact currents presents similar, albeit even more difficult, challenges to Commission licensees and others. Under the Commission's proposal, broadcasters and others will for the first time be required to comply with a standard for contact currents.⁵⁸ Yet, if anything, the measurement technology for contact currents is even less developed than it is for induced currents -- only a single meter is believed to be available at present. Moreover, even if such meters were readily available, standardized measurements of contact currents would still be difficult or impossible, since each individual's susceptibility to contact currents is different.

An additional problem with contact current standards is that such currents may not be present only on tower structures (such as AM arrays), but could be produced on metal objects that are not in direct contact with the antenna. While the objects on which contact currents could be produced would have to be large (approaching a quarter wavelength or more), it would nonetheless be possible, for example, to energize construction cranes or metallic rope located as much as a half mile from an AM tower.

This creates certain obvious logistical problems in imposing any contact current standard. It is simply not practical to require broadcasters constantly to measure --

⁵⁸ See *NPRM*, 8 F.C.C. Rcd at 2852.

even if accurate and standardized meters were to exist -- all metal objects near AM towers. Moreover, even if the Commission were to require measurements only at some interval (*e.g.*, license renewal), such readings would be virtually useless because the structures nearby will change over time.⁵⁹ For example, construction cranes can be installed overnight, and then move throughout the day; some cranes near AM towers might generate contact currents in only some positions. Thus, a requirement that broadcasters measure all possibilities would necessitate needless expense without any commensurate increase in public safety.

As an alternative to requiring measurements which would be of very dubious value, the Broadcast Joint Commenters recommend that broadcasters be deemed in compliance with the contact current standard as to tower workers and climbers if such workers wear protective gloves and suits. A recent study by the Office of Engineering and Technology showed that such protective clothing could be effective in reducing the risk of contact currents.⁶⁰ Further, with respect to currents possibly produced on structures not in direct contact with the antenna, the agency should develop compliance models; until that time, the Broadcast Joint Commenters suggest that compliance with the contact current standard be assumed where the ANSI/IEEE requirements as to MPE

⁵⁹ Put differently, contact measurements at the time of broadcast station renewal would not necessarily demonstrate conformance to the contact current standard over the previous license term, nor would they predict compliance in the future.

⁶⁰ See FCC Public Notice, Mimeo No. 40917 (Dec. 8, 1993); R. Tell, RF Current Reduction Provided by Work Gloves at AM Radio Broadcast Frequencies, FCC/OET RTA-93-01 (1993). See also Technical Bulletin OST 65 at 28.

are met. Such an assumption would not appear to be unreasonable since broadcast transmitters that comply with the MPE limits are less likely to generate instantaneous contact currents in excess of the standards in metal objects not in direct contact with the antenna.

For those occasions where actual readings are required on an *ad hoc* basis,⁶¹ the broadcast industry will work with the FCC to review contact current meters and settle on an appropriate standard unit. However, and most importantly, the FCC -- with the industry -- should formulate simple analytical models for contact currents in the revision of Technical Bulletin OST 65 so that broadcasters can easily verify compliance through reference to formulas, charts and tables. Such specification and precision is a precondition for enforcement of any contact current standard.

V. THE COMMISSION SHOULD ALLOCATE RESPONSIBILITIES FOR COMPLIANCE WITH THE NEW STANDARDS, PROVIDE A TRANSITION PERIOD, AND BEGIN TO REFINE MEASUREMENT PROCEDURES

A. The Commission Should Develop Measurement Procedures and Establish a Transition Period

In its *NPRM*, the Commission recognized "that compliance with the new ANSI/IEEE guidelines could impose new and significant burdens on some licensees and

⁶¹ Broadcast stations may have to determine the contact currents at various points on a tower or other structure in order to assess the need for safety precautions such as gloves.

equipment manufacturers."⁶² The FCC therefore sought "to minimize this impact wherever possible" while at the same time fully protecting the public.⁶³ The agency then called for comments on how to implement the new ANSI/IEEE standard.

The Broadcast Joint Commenters concur with the Commission's reasonable approach. In particular, the FCC should not suddenly switch regulatory obligations without permitting licensees and others a period during which they can convert to the new standards. Nor should the Commission impose compliance obligations that are impossible to meet, either because valid and standardized measurement procedures do not exist, or because -- as discussed above -- the technology necessary to conduct the necessary measurements is still in its infancy.⁶⁴

It is therefore important that, before the effective date of the new standard, the FCC designate with specificity the procedures it will require to demonstrate compliance. Absent detailed instructions, licensees and others will be unable to determine whether they conform to the legal requirements. Without specific procedures, the FCC will have no way to verify compliance and obtain valid and repeatable results. Simply put, therefore, without standard industry compliance policies that specify particular measurement procedures and technology, and the appropriate theoretical modeling where necessary, any requirement that broadcasters meet the 1992

⁶² *NPRM*, 8 F.C.C. Rcd at 2853.

⁶³ *Id.*

⁶⁴ The *NPRM* recognized that measurement technology may limit the practical ability to demonstrate compliance. See *NPRM*, 8 F.C.C. Rcd at 2854.

ANSI/IEEE standards for induced and contact currents would be unreasonable and contrary to the public interest.⁶⁵

Some guidance can be obtained in the companion ANSI/IEEE document C95.3-1992 that addresses measurement procedures. The Broadcast Joint Commenters concur in the FDA's recommendation that the Commission endorse this text as well.⁶⁶

However, as discussed above, most of the necessary guidance can only come after the Technical Bulletin OST 65 compliance procedures have been revised. In that revision process, the Commission and interested parties can determine the appropriate methodology to use for measuring induced and (perhaps) contact currents, including, among other things, the proper "reasonable man" or human equivalent model for such measurements.⁶⁷ And, perhaps most importantly, the Commission should revise its existing "safe harbor" models to permit licensees, especially broadcasters, to continue to refer to graphs and tables to determine compliance in many instances without making complex and time-consuming *ad hoc* measurements.

⁶⁵ As noted by Panasonic:

The engineer needs to have and relies on analytical tools (mathematical analysis) and laboratory techniques to predict the final result. . . . The engineer must know, with some level of confidence, that his design will meet certain criterion. Thus the FCC should approve some analytical techniques as appropriate *to verify* and later *to certify* the compliance of [RF emitters] with the Standard.

Comments of Matsushita Communication Industrial Corp. [MCC/Panasonic], ET Docket No. 93-62, at 10 (filed Nov. 12, 1993) (emphasis in original).

⁶⁶ See FDA Comments at 2.

⁶⁷ Some meter manufacturers have developed such human equivalent antennas.

Once the revision of Technical Bulletin OST 65 is complete, the industry will need a period of transition before it is required to comply with the new rules.⁶⁸ First, some period of time will be necessary for broadcasters and consulting engineers to obtain and become familiar with the test equipment ultimately specified by the revised version of Technical Bulletin OST 65. Additional time will be required to determine whether existing facilities are in compliance with the new standards, including the making of measurements in those cases where compliance cannot be determined by analytical methods. Finally, when this process is complete and potential compliance problems have been identified, a reasonable period will be necessary for broadcasters to design practical solutions to such problems. In all, the Broadcast Joint Commenters recommend that the Commission allow a transition period of two years after the revised version of Technical Bulletin OST 65 is released before it begins enforcement of the new policies as to broadcasters and other licensees.⁶⁹ Indeed, given the relative

⁶⁸ Particularly in light of the fact that the next radio license renewal cycle is less than two years away, the Broadcast Joint Commenters note that renewal applicants will need ample time after the revision of Technical Bulletin OST 65 to meet their new obligations. *Cf. NPRM*, 8 F.C.C. Rcd at 2853 & n.31.

⁶⁹ This approach would parallel the process described by the Commission at the time the original regulations were adopted in 1985:

In order to address these various concerns related to the determination of compliance with standards, and to give guidance to our licensees, we plan to issue a technical bulletin which will be developed by Commission staff before the effective date of our rule amendment. This bulletin will discuss prediction methodology, evaluation of exposure situations, measurement problems, multiple source siting, and other relevant issues.

scarcity of the technology necessary to determine compliance (as described above), time will be required merely to procure the necessary equipment.

Such a transition period would in no way imperil public safety. Once again, it must be emphasized that ANSI/IEEE found that "no verified reports exist of injury to human beings or of adverse effects on the health of human beings who have been exposed to electromagnetic fields within the limits of frequency and SAR specified by previous ANSI standards."⁷⁰ Continued adherence to the Commission's existing rules and compliance practices during the transition period will, therefore, fully protect the public from any substantiated risk from RF fields.⁷¹

B. The Commission Should Allocate Compliance Responsibilities

Once the measurement procedures are fully refined and effective, and after a suitable interval, the Broadcast Joint Commenters agree that applicants for new facilities, as well as those for license renewal, should be required to show in the relevant application that they adhere to the new standard.⁷² In addition, the manufacturers of new broadcast auxiliary equipment that comes with a permanently installed antenna should be required to establish controlled and uncontrolled "set-off"

⁷⁰ ANSI/IEEE Standard, § 6.

⁷¹ See IEEE COMAR Comments at 1 ("there exists no credible evidence of harm to human beings resulting from exposure at levels specified in ANSI C95.1-1982. ").

⁷² *NPRM*, 8 F.C.C. Rcd at 2853.

zones calculated under the new standards and procedures. This will enable broadcasters to configure such equipment to ensure that unauthorized persons do not enter the restricted exposure zones.⁷³ The FCC should also invite the manufacturers of equipment that will be licensed under Part 74 to provide input for a revised Technical Bulletin OST 65 as to the appropriate set-off distances when the equipment is used with the sorts of antennas commonly employed.⁷⁴ Broadcasters will comply by allowing the public no closer than the minimum distance to the RF source for the uncontrolled area, and knowledgeable and informed people (plus transients) no closer than the minimum distance to the RF source for the controlled zone. Broadcasters will then substantiate such compliance at renewal.

Broadcasters do not believe, however, that additional paperwork should be added to establish compliance with the new policies.⁷⁵ Broadcasters already certify to the accuracy of the information on their renewal form, including the "major action" question.⁷⁶ Requiring additional data would thus be needlessly burdensome to the

⁷³ As an example, broadcasters can ensure that only persons aware of the potential for RF exposure can come near operating electronic news gathering equipment.

⁷⁴ The Broadcast Joint Commenters recognize the virtually infinite variety of circumstances that may be encountered in the use of broadcast auxiliary equipment. Accordingly, while Technical Bulletin OST 65 can offer guidance in certain situations, it should also afford broadcasters the means for calculating the appropriate controlled and uncontrolled zones in order to determine compliance in those situations not readily covered by examples.

⁷⁵ The Commission's *NPRM* questions whether it should require additional proof of compliance with RF exposure policies. See *NPRM*, 8 F.C.C. Rcd at 2853.

⁷⁶ See 47 C.F.R. § 73.3513(d) (1992) (providing sanctions for willful false statements in a broadcast application); 47 C.F.R. § 73.1015 (1992) (forbidding broadcasters from making any "misrepresentation or willful material omission" to the Commission).

broadcaster, not to mention unnecessarily straining the resources of the Mass Media Bureau. Additionally, the Commission will be able to review compliance directly, for new equipment with fixed antennas under the equipment authorization process.

The Commission should also reiterate the relative responsibilities of compliance with RF exposure limits at sites with multiple transmitting facilities.⁷⁷ At present, compliance with the overall limit is "the shared responsibility of all licensees (not otherwise categorically excluded. . .)."⁷⁸ With the proposed additional regulatory requirements, this coordination will become even more essential.⁷⁹ Again, procedures to cover such cases could be contained in the revision of Technical Bulletin OST 65.

VI. THE COMMISSION SHOULD PREVENT FEDERAL POLICIES ENCOURAGING GROWTH IN THE USE OF RADIO FROM BEING SLOWED BY INCONSISTENT STATE AND LOCAL REGULATION

In fulfillment of its obligations under NEPA, the FCC intends in this proceeding to update the federal standard for evaluating the environmental effects of RF emissions emanating from licensed radio facilities. Whatever policies the FCC adopts for RF exposure standards, the Commission's regulations will constitute a federal

⁷⁷ See Broadcast Signal Lab Comments at 3.

⁷⁸ 47 C.F.R. § 1.1307(b) note 2.

⁷⁹ The revised ANSI/IEEE standard does contain a guide to evaluating overall exposure from multiple sources. See ANSI/IEEE Standard, app. C.

determination as to the appropriate level of protection for the public and for workers from exposure to RF energy.

State or local laws that undermine the FCC's expert balancing of the costs and benefits of radio transmitter deployment stand as an obstacle to the accomplishment and execution of Congress's objectives in the Communications Act.⁸⁰ In particular, state laws that impede or thwart deployment of radio facilities deemed to be in the public interest⁸¹ through inconsistent regulation of RF exposure should not be permitted to stand.⁸² The Commission and the courts have on numerous occasions preempted state and local regulations in order to preserve the public's right to radio services provided under Commission authorization. Among the regulations preempted by the FCC have been local restrictions on antenna height,⁸³ local land use ordinances,⁸⁴ local regulations prohibiting the use of the vertical blanking interval,⁸⁵ and geographic

⁸⁰ See, e.g., *Louisiana Pub. Serv. Comm'n v. FCC*, 476 U.S. 355 (1986); *Capital Cities Cable, Inc. v. Crisp*, 467 U.S. 691 (1984).

⁸¹ See 47 U.S.C. § 303(g) (1988) (directing the FCC to "encourage the larger more effective use of radio").

⁸² See, e.g., 47 U.S.C. § 151 (1988) (granting the Commission authority to regulate interstate commerce "in communication by . . . radio so as to make available, so far as possible, to all the people of the United States a rapid, efficient, Nation-wide, and world-wide . . . radio communications service"); *American Broadcasting Co. v. FCC*, 191 F.2d 492 (D.C. Cir. 1951).

⁸³ See, e.g., *Bodony v. Incorporated Village of Sands Point*, 681 F. Supp. 1009 (E.D.N.Y. 1987).

⁸⁴ See, e.g., *Van Meter v. Township of Maplewood*, 696 F. Supp. 1024 (D.N.J. 1988); *Satellite Earth Stations (Preemption)*, 59 Rad. Reg. 2d (P & F) 1073, 1085, *recon. denied*, 61 Rad. Reg. 2d (P & F) 608 (1986).

⁸⁵ See, e.g., *Vertical Blanking Interval*, 57 Rad. Reg. 2d (P & F) 832, 838, *recon. denied*, 58 Rad. Reg. 2d (P & F) 819 (1985).

prohibitions on the use of radio transmitters.⁸⁶ Because, as discussed below, emerging state and local regulation of RF exposure inconsistent with federal safety standards may impede the construction of duly authorized radio facilities, the FCC should consider preempting such regulations.⁸⁷

**A. State and Local Jurisdictions Are
Implementing RF Exposure Regulations that
Threaten Important Federal Policy Goals**

In recent months, public concern regarding the effects of exposure to radio emissions has intensified significantly.⁸⁸ Unfortunately, however, the result of this attention at the state and local level has not always been productive. The FCC has the resources and objectivity necessary to balance radio usage and exposure issues in a rational manner. This expertise is often lacking among state and local regulators who must often address RF exposure issues in an atmosphere of fear and ignorance. Some actions by state and local regulators have blocked, or substantially adversely affected, construction of radio facilities found to be in the public interest. Furthermore, if left unchecked, such regulatory obstacles could significantly impede the establishment of

⁸⁶ See, e.g., Hon. Harvey I. Sloane, 35 Rad. Reg. 2d (P & F) 845 (1975).

⁸⁷ When the Commission adopted its RF exposure regulations in 1985, after reviewing comments, the agency concluded it was not then necessary "to resolve the issue of federal preemption of state and local RF standards." However, it stressed: "Should non-federal RF radiation standards be adopted, adversely affecting a licensee's ability to engage in Commission-authorized activities, the Commission will not hesitate to consider this matter at that time." *Amendment of Part 1*, 100 F.C.C.2d at 558.

⁸⁸ See Separate Statement of Commissioner Ervin S. Duggan, 8 F.C.C. Rcd at 2862.

new High Definition Television ("HDTV") facilities -- a central objective of FCC broadcast policy in the 21st century.

Some examples of states and localities which have adopted or threatened to adopt RF exposure standards at variance with the ANSI limits include the following:

- Massachusetts adopted regulations containing specific power density limits for non-ionizing RF radiation, including an "occupational"/"public" dichotomy.⁸⁹ These regulations include intricate compliance procedures and notification requirements for distinguishing occupational and public exposure, none of which bear any relation to the ANSI/IEEE standard. Because of the peculiarities of the Massachusetts procedures and notice requirements, emissions from broadcast transmitters in that state largely have been classified as involving exposure of the public, necessitating compliance with emission limits vastly different from the new ANSI/IEEE standard.
- In Washington State, Seattle and King County nearly adopted rules that would have limited RF power densities in the 30-300 MHz range to 100 $\mu\text{W}/\text{cm}^2$, half that of the ANSI/IEEE standard. Only a concerted effort by broadcasters persuaded the town and county to codify a 200 $\mu\text{W}/\text{cm}^2$ limit, equivalent to ANSI/IEEE.⁹⁰
- The Commonwealth of Puerto Rico adopted its own RF radiation rules on June 4, 1992.⁹¹ The rules are accompanied by a new bureaucracy, as well as substantial and burdensome regulatory requirements that could slow the growth of radio services in Puerto Rico.⁹²

⁸⁹ Mass. Regs. Code tit. 150, § 122.015 (1986); Mass. Regs. Code tit. 453, § 5.07 (1986).

⁹⁰ Microwave News at 8-9 (Jan./Feb. 1992).

⁹¹ Microwave News at 15 (July/Aug. 1992).

⁹² See Celpage Comments, ET Docket No. 93-62, at 5 (filed Dec. 9, 1993) ("RF rules [in Puerto Rico] require FCC licensees to perform extremely complicated, and unnecessary, engineering studies prior to using any new transmitter site, and whenever an additional transmitter is installed at an existing site.").

- The Village of Wilmette, Illinois, adopted a requirement that power densities from cellular base stations be below $0.25 \mu\text{W}/\text{cm}^2$ at ground levels 1,000 feet from the proposed site.⁹³ This standard bears little relation to ANSI/IEEE.
- California is now examining creation of a state-wide standard for permissible field strengths from cellular base stations.⁹⁴ Although the state concluded that the FCC had preempted regulation of cellular handsets, the possibility exists that California will adopt RF tower field limits different than those specified by ANSI/IEEE.

Clearly, the exercise of such jurisdiction by local agencies could thwart the FCC's licensing policies by either delaying or preventing use of authorized radio facilities, to the detriment of the viewing and listening public.

This is particularly true with respect to the deployment of HDTV. Sometime next year, the Commission is expected to issue rules establishing a high definition television service that may eventually replace current NTSC transmissions. The plan is to provide all interested broadcasters with an additional program channel, either in the UHF or VHF spectrum, and then to require simultaneous transmissions in NTSC and HDTV formats for a period of at least 15 years.⁹⁵ Preliminary drafts of the FCC's HDTV Allotment Table show that in many cases the Commission expects that these new transmitters will be co-located with existing NTSC facilities. As a result, the total

⁹³ The Village of Wilmette Reply Memorandum, ET Docket No. 93-62 (filed Nov. 29, 1993) (attaching Resolution 93-R-34).

⁹⁴ Microwave News at 14 (Jan./Feb. 1992); California Pub. Util. Comm. News Release, CPUC-81 (Nov. 2, 1993).

⁹⁵ See Advanced Television Systems, 3 F.C.C. Rcd 6520-21, 6530 (1988); Advanced Television Systems, 7 F.C.C. Rcd 6924, 6937-39, 6964 (1992).

transmitter power of each participating television station will roughly double for some time.

The FCC has found the conversion to HDTV to be in the public interest.⁹⁶ But state and local regulations as to RF exposure more stringent than those set forth in the ANSI/IEEE standards could inhibit the ability of broadcasters to construct and operate HDTV facilities, particularly at multiple user sites. Such a result, occasioned by a patchwork of state and local regulation, would clearly be inconsistent with federal communications policy.

**B. The FCC Should Initiate a Proceeding To
Examine the Preemption of State and Local
RF Regulations Where Inconsistent With
Federal Policy Goals**

When it adopts its new policy in this proceeding, the FCC will of necessity be striking what it believes to be the appropriate balance between any demonstrated risks of RF exposure and service to the public. State and local regulations that impose more restrictive RF exposure criteria or different compliance procedures would conflict with the federal regulation of broadcasting intended by Congress. Exercise of jurisdiction by the states in this area could thwart the deployment and use of authorized radio facilities, and might affect adversely the establishment of HDTV. Such barriers would directly contravene express federal determinations that balance the need to protect

⁹⁶ Advanced Television Systems, 3 F.C.C. Rcd at 6521.

persons from undue exposure to RF radiation and the public benefits of radio transmissions.

With the conclusion of the instant proceeding, the FCC will have a record upon which to base explicit federal determinations that compliance with the ANSI/IEEE criteria is sufficient to protect the public from any demonstrated risk of RF exposure. The Commission should augment this record by seeking information regarding inconsistent state and local actions. The goal of this effort would be to determine the nature and extent to which federal preemption of state and local regulation of RF exposure is necessary and appropriate.

Failure to examine state and local regulation could undermine the Commission's entire efforts in this docket. Particularly if such jurisdictions adopt different policies, an unworkable checkerboard of RF standards could be created. As a result, adoption of a new standard for RF exposure should be expressly linked with the preemption of inconsistent state and local RF exposure regulations. The Broadcast Joint Commenters accordingly request that the Commission issue a further notice, simultaneously with the release of its *Report and Order* on the revised ANSI/IEEE standard, addressing preemption of state and local policies that interfere with the operation of the Communications Act.

VII. CONCLUSION

The Broadcast Joint Commenters support the Commission's proposal to update its RF radiation standards by embracing the new ANSI/IEEE guidelines. However, the standard raises a number of important issues as to implementation.

First, in applying the new higher standard of protection applicable in certain situations, the Commission should adopt the dichotomy between controlled and uncontrolled environments proposed by ANSI/IEEE. That dichotomy strikes an appropriate balance by providing an extra margin of safety to protect the public at large from any possible risks of prolonged RF exposure, while still ensuring, through the concept of transience, that the standard will not be applied to broadcasters in an inflexible or impractical manner.

Second, it is vital that the agency provide clear and repeatable techniques for licensees and others to demonstrate compliance with the new standards as they are adopted. The agency can best accomplish this by revising its Technical Bulletin OST 65 compliance bulletin. Any redrafted compliance procedures should, like the existing document, provide calculable "safe-harbors" in formulas, charts and tables that permit licensees to show compliance simply and effectively. The Broadcast Joint Commenters are prepared to assist the FCC in this revision of its compliance manual.

Nowhere is this more important than for the new induced and contact current standards. As discussed above, before compliance with the new induced current standard is required, additional work will be necessary to establish the reliability of